DOCUMENT RESUME

ED 434 258 CE 079 295

AUTHOR Hager, Paul
TITLE Learning in the Workplace. Review of Research.
INSTITUTION National Centre for Vocational Education Research, Leabrook (Australia).
ISBN ISBN-0-87397-439-5
PUB DATE 1997-00-00
NOTE 37p.
AVAILABLE FROM National Centre for Vocational Education Research, 252 Kensington Road, Leabrook, South Australia 5068, Australia. E-mail: ncver@ncver.edu.au; Web site: <http://www.ncver.edu.au/>.
PUB TYPE Information Analyses (070)
EDRS PRICE EDRS Price MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS Adult Education; Adult Literacy; *Certification; Competence; Conventional Instruction; Cost Effectiveness; Credits; *Education Work Relationship; Educational Environment; Educational Policy; *Educational Quality; Educational Research; Educational Trends; Employer Employee Relationship; Employment Qualifications; Evaluation Methods; Foreign Countries; Informal Education; Instructional Materials; Integrated Curriculum; Job Skills; Learning Activities; *Learning Processes; Literacy Education; Literature Reviews; *On the Job Training; Outcomes of Education; Personnel Evaluation; Recordkeeping; Research Needs; Skill Development; Transfer of Training; Trend Analysis; *Vocational Education
IDENTIFIERS *Australia

ABSTRACT

Research on changes and issues in workplace learning in Australia over the past 6 years was reviewed. Special attention was paid to four topics: importance of learning in the workplace; nature of workplace learning; factors affecting the quality of workplace learning; and recognition of workplace learning. Selected findings were as follows: (1) simple notions of transfer of skills learned in the workplace are dubious; (2) although some learning in the workplace is highly contextualized and enterprise specific, other examples are more generic; (3) measuring the outcomes of training and quantifying its costs and benefits are possible but complex; (4) the best kinds of workplace learning involve appropriate links between formal training and informal workplace learning; (5) good research on learning in the workplace must take proper account of the diversity of variables in the workplace environment/culture; and (6) language, numeracy, and literacy are capable of being addressed in a holistic way along with other changes as workplace reform is implemented. Areas identified as requiring additional research included the following: training outcomes; training costs and benefits; application of cognitive theory to training activity design; and roles of language, numeracy, and literacy in workplace learning and change. (Contains 50 references.) (MN)

ED 434 258

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☑ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

NCVER

Learning in the workplace

Paul Hager

CE 077 295

BEST COPY AVAILABLE

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY

S Hagner

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

Learning in the workplace

Paul Hager

NCVER

© Australian National Training Authority, 1997

This work has been produced with the assistance of funding provided by the Australian National Training Authority (ANTA) and is published by the National Centre for Vocational Education Research (NCVER) Ltd, A.C.N. 007 967 311 under licence from ANTA. Apart from any use permitted under the Copyright Act 1968, no part of this publication may be reproduced by any process without the written approval of NCVER Ltd. Requests should be made in writing to NCVER Ltd.

ISBN 0 87397 439 5

TD/TNC 51.05

Published by NCVER
252 Kensington Road
Leabrook SA 5068

Contents

Executive summary *1*

Importance of learning in the workplace *6*
- policy matters

Nature of learning in the workplace *9*
- how transferable are skills learnt in the workplace?
- contextuality of workplace competence and its implications
- portability of skills
- outcomes of training
- can the cost-benefits of training be demonstrated?
- integration of training

Factors that affect the quality of learning in the workplace *20*
- the workplace environment/culture
- authentic learning experiences
- quality of learning materials
- role of language and literacy
- company/business size

Recognition of learning in the workplace *24*
- crediting workplace performance
- assessing on-the-job
- record keeping
- industrial relations issues

Findings and directions for further research *27*

References *29*

Executive summary

THIS REPORT ANALYSES recent Australian research on learning in the workplace and assesses current knowledge of the various facets of this topic. A central theme is that major policy and macroeconomic shifts are broadening its scope to include informal learning at work as well as formal on-the-job training.

Importance of learning in the workplace

Growing interest in workplace learning is due to various factors, including:

- It is a vital component of Australia's national training framework, particularly with the new emphasis on the demand side of training.
- The impact of change, including the increasing globalisation of the world economy. This has created pressures for integrating of new kinds of work organisation with innovations in technology, in skill formation practices, and in employee commitment, participation and remuneration.

Nature of learning in the workplace

'Learning in the workplace' refers to formal on-the-job training and/or to informal workplace learning. Both are important, with some research stressing the importance of productive interaction between the two. However, a serious obstacle is that informal workplace learning is very different from either on-the-job training or learning in formal education.

Informal workplace learning has not been researched widely, so the Australian research on this topic is innovative. Despite the past tendency to overlook informal workplace learning in favour of formal on-the-job training, there is increasing evidence that it is crucial for skill formation to contain appropriate links between the two.

Topical issues

Transferability of skills learnt in the workplace

The research strongly suggests that simple notions of transfer are very dubious. It is more appropriate to think in terms of a developing capacity to successfully apply previous knowledge to new situations, while at the same time acquiring new knowledge and understanding.

Context of workplace competence

Contextual issues cover the areas of:

- generic v. contextualised training
- the highly contextualised nature of key competencies
- the link between key competencies and high performance workplaces
- the link between contextuality and broader views of competence

Portability of skills learnt in the workplace

The paucity of research in this area suggests that some employers are fearful of workers acquiring portable skills. However, contextuality of skills sets some limits to portability. When asked about the portability of their skills, workers tend to think only in terms of specific skills, thereby overlooking their more generic capacities which are even more portable.

Outcomes of training

Training outcomes can be based on four levels of evidence:

- Level 1: Evidence of staff responses to the training
- Level 2: Evidence of the competencies achieved
- Level 3: Evidence that the skills are used and maintained
- Level 4: Evidence of effects on business performance

It is common to assess the outcomes of training at Level 1 (e.g. participants complete simple questionnaires). Level 2 assessment is less common, and assessment at Levels 3 and 4 is rare. These levels also point to the complications of measuring the cost-benefits of training.

Integration of training

'Integration of training' refers to several important research issues:

- Integration of on- and off-the-job training
- Training linked to specific programs, such as quality improvement
- Training that seeks to integrate all relevant organisational variables

Factors that affect the quality of learning in the workplace

The quality of the learning that occurs in the workplace is very sensitive to a range of related factors. Major ones identified in the research include:

- the workplace environment/culture
- authentic learning experiences
- quality of learning materials
- role of language and literacy
- company/business size

Recognition of learning in the workplace

Crediting workplace performance

Although procedures for assessing and accrediting formal on-the-job training are familiar, the same cannot be said for informal workplace learning. Thus, despite the wide acceptance of recognition of prior learning (RPL) in Australia, further research is needed to refine and extend this initiative.

Assessing on the job

Crucial issues include the proper training of assessors; the value of integrated, more holistic assessments; the need to ensure adequate validity and reliability of assessment; the need for training and assessment to take into account the literacy, numeracy and language needs of trainees; the extent to which standards can be made enterprise specific whilst still allowing candidates to maintain skills portability; and the need for improved assessment instruments. Further research on these issues would be timely.

Record keeping

There are differences in how records are maintained depending on the context in which the assessment occurs and its purpose. Considerations of portability require that assessment candidates have a duly certified statement of their assessment results as future evidence of their skills. So far there is not much Australian research on this topic.

Industrial relations issues

Flowing from national training reform, a de facto relationship exists between remuneration and skill levels. So it is very important that the procedures for recognition of learning and competence be fair and equitable.

Findings on what we know

Though research on learning in the workplace is a fairly recent phenomenon, so far, it has demonstrated that:

- simple notions of transfer of skills learnt in the workplace are dubious
- while some learning in the workplace is highly contextualised and enterprise specific, other examples are more generic
- measuring the outcomes of training and quantifying its cost-benefits are possible but complex
- the best kinds of learning in the workplace involve appropriate links between formal training and informal workplace learning
- good research on learning in the workplace needs to take proper account of the diversity of variables in the workplace environment/culture
- language, numeracy and literacy are capable of being addressed in a holistic way along with other changes as workplace reform is implemented
- there is much confusion about RPL even though it enjoys wide support

Findings on what we need to know

Learning in the workplace, especially the informal kind, needs a lot more high quality research, especially given the importance it is attaining due to workplace reform. More specific topics in need of research include:

- the outcomes of training and its cost-benefits
- the nature of productive links between formal training and informal workplace learning
- application of cognitive theory to the design of training activities
- roles of language numeracy and literacy in workplace learning and change
- applications of RPL to informal workplace learning
- assessment of learning in the workplace
- record keeping and management of assessment systems.

Importance of learning in the workplace

LEARNING IN THE workplace is viewed as vital to the implementation of Australia's national training program, whose overarching concern is to improve the nation's skill formation process. Major features of this program (ANTA 1994, p. 1) include:

- training which integrates industry, enterprise and individual needs and supports lifelong learning
- competency-based training, achieving national industry and enterprise standards
- more flexible pathways and delivery
- increased access and improved outcomes for groups of people who have missed out on training opportunities in the past
- complementary roles for on- and off-the-job training
- nationally recognised qualifications which are portable across industries and States and Territories
- a broader range of providers who co-operate and compete to meet national and international training demands.

If learning in the workplace is thought of as formal structured training, it is explicitly given a significant role in the fifth of these points; it is also implicit in the first, third and fourth. However its connection with the other points emerges when the scope of 'learning in the workplace' is expanded to include informal workplace learning.

Following the Allen Consulting Group's review of progress in implementation of the national training reform agenda (ACG 1994a, 1994b, 1994c, 1994d), the Australian National Training Authority (ANTA) has adopted measures to move the training emphasis more to the demand side. These measures include placing more responsibility for developing, endorsing and implementing competency standards in the hands of enterprises with a quality Executive

summary assurance approach replacing rigid central regulation (ANTA 1994). If successful, these changes will increase the role of learning in the workplace in the overall skill formation and accreditation system. However, there is little in the documents relating to these changes that shows awareness of the full scope of learning in the workplace as discussed above. If the new emphasis on the demand-side of training is taken to its logical conclusion, then the role of learning in the workplace will become even more crucial to training reform than it has been so far. This is so, since a focus on the demand-side of training gives privileged status to the workplace as a site of learning, when the main question about training needs becomes 'what learning needs to occur for productive participation in this workplace?', rather than 'what available courses should our staff take?'.

Another major factor behind the growing interest in learning in the workplace is change itself. There are any number of indicators of the presence of change. A major one, linked to many of these indicators, is the increasing globalisation of the world economy. Ford (1990 pp. 1–2) argues that the overall impact of change is such that the standard concepts that have been used for thinking about workplaces, such as 'technology', 'work organisation', 'employment relations', and the like, have lost their currency and now serve merely to cloud our thinking. According to Ford, this is because they derive from the era of the early forms of mass production and involve assumptions that no longer apply.

Policy matters

The most visible impact of Australia's national training program has been the widespread development of competency standards. As a result, competency-based training has become increasingly prominent. However, many have worried that narrow approaches to competence, which focus on performance of discrete tasks will defeat the aim of expanding and deepening the skills of the workforce. Hence the increasing recognition of the need for broader approaches to competence (e.g. NSW Government Green Paper 1996, p. 23–24). Ford (1990) traced the adoption of narrow approaches to competence to the adherence to outmoded concepts, as noted above.

According to Ford (1990 pp. 3–5), the internationalisation of demand has meant that organisations need to transform themselves to provide greater quality, improvement, innovation, adaptability, reliability and service.

The required transformations by organisations centre on a more multifunctional and multiskilled workforce, facilitated by the creation of a responsive workplace culture. There are diverse strategies for achieving this, but they generally integrate new kinds of work organisation, innovations in technology, innovative skill formation practices, and innovations in employee commitment, participation and remuneration.

Ford (1990 p. 8) argues that 'skill formation' should be viewed as 'an emerging holistic concept that embraces and integrates formal education, induction, continuous on-the-job learning, recurrent off-the-job learning and personal development'. By pointing to the importance of continuous on-the-job learning in skill formation, Ford is endorsing the wider notion of learning in the workplace as outlined at the start of this report. It should be noted that Ford's characterisation of the changing workplace is not merely a theoretical one, but is grounded in diverse experiences of workplace reform and organisational transformation (Field & Ford 1995).

While the two main factors behind the growing interest in learning in the workplace are its role in the national training framework and the impact of change, other factors are also relevant. These include:

- training providers seeking to satisfy industry training requirements
- the search for cheaper alternatives to the high costs of off-the-job training to small- and medium-sized businesses
- it provides a possible way to overcome the remoteness of many trainees from the centres that offer off-the-job training in their field

Factors such as these are behind some of the research projects discussed in the following sections.

Nature of learning in the workplace

As noted earlier, the term 'workplace learning' is ambiguous. It can refer to formal on-the-job training as distinct from off-the-job training in, for example, vocational education institutions. However, 'workplace learning' can also refer to the informal learning that occurs as people perform their work. The research discussed in this report tends to stress the importance of both these kinds of learning in the workplace and points to the importance of productive interaction between them. Here the term 'informal workplace learning' is used to distinguish it from the formal learning of 'on-the-job training'. The wider term 'learning in the workplace' is used where the distinction does not matter.

A major obstacle to informal workplace learning's being taken seriously as a component of a person's overall education is the way that it differs on many criteria from traditionally accepted 'educational' activities. While this is most obvious in the vast differences between informal workplace learning and typical learning in educational institutions, it is also the case that informal workplace learning is very different from on-the-job training. These differences can be described as follows:

- Teachers/trainers are in control in both formal learning in educational institutions and in on-the-job training, whereas it is the learner who is in control (if anyone is) in informal workplace learning. That is, formal learning is planned, but informal workplace learning is often unplanned.
- The learning that takes place in educational institutions and in on-the-job training is largely predictable as it is prescribed by formal curricula, competency standards, learning outcomes, etc. Informal workplace learning is much less predictable as there is no formal curriculum or prescribed outcomes.
- In both educational institutions and on-the-job training, learning is largely explicit (the learner is expected to be able to articulate what has been learnt, e.g. in a written examination, in oral answers to instructor

questioning, or in being required to perform appropriate activities as a result of the training). In informal workplace learning, the learning is often implicit or tacit (the learner is commonly unaware of the extent of their learning).

- In formal classrooms and in formal on-the-job training the emphasis is on teaching/training and on the content and structure of what is taught/trained (largely as a consequence of the three previous points). Whereas in informal workplace learning the emphasis is on learning and on the learner.
- In formal classrooms and in formal on-the-job training the focus is usually on learners as individuals and on individual learning. In informal workplace learning, the learning is often collaborative and/or collegial.
- Learning in formal classrooms is uncontextualised, i.e. there is an emphasis on general principles rather than their specific applications. While formal on-the-job training is typically somewhat contextualised, even here there is some emphasis on the general e.g. the training might be aimed at general industry standards. However, informal workplace learning is by its nature highly contextualised.
- The learning that takes place in educational institutions and in on-the-job training is conceptualised typically in terms of theory (or knowledge) and practice (application of theory and knowledge). The learning that comes from informal workplace learning, on the other hand, seems to be most appropriately thought of as seamless know how.

10

Given these trends, it is hardly surprising that formal learning/education has been seen as being much more valuable than informal learning (including informal workplace learning). Informal workplace learning is a paradigm case of informal education and, hence, tends to be undervalued particularly by those with a stake in the formal education system at whatever level. Historically, training has been viewed as the antithesis of education. It is only a slight caricature to say that training has been thought of as aimed at mindless, mechanical, routine activity in contrast to education which aims for development of the mind via completion of intellectually challenging tasks.

Despite this 'chalk and cheese' conception of education and training, the trends just noted above show that in many key respects the two have more in common with one another than either one does with informal workplace

learning. One indicator of this is the rapid growth of formalised workplace training that incorporates externally accredited courses. This is occurring at all levels of the workforce from operatives through to senior managers. It is a trend that is expected to continue (Misko 1996). In contrast, external accreditation of informal workplace learning is still very rare. (The reasons for this state of affairs are outlined in the first sub-section of section 4 of this report).

As could be predicted from the above, informal workplace learning has not been researched widely (Hager 1996). Thus, the Australian research on informal workplace learning discussed in this report is innovative. Despite the past tendency to overlook informal workplace learning in favour of formal on-the-job training, there is an increasing claim emerging that it is crucial that skill formation features appropriate links between the two. Their joint contribution to Ford's holistic concept of 'skill formation' was noted in the previous section. The research of Sefton et al. (1995) at four sites in the automotive industry broadly supports Ford's holistic view of skill formation. As they state: 'Results of this research demonstrate clearly that both informal learning and formal training are important in the workplace. More important however are links between the two.' (Sefton et al. 1995, p. 178).

There are a number of topical issues that surround learning in the workplace. The remainder of this section considers these.

How transferable are skills learnt in the workplace?

All of the research points to the fact that simple notions of transfer are very dubious. As Misko (1995) suggests, it is more realistic to view transfer as application of previous knowledge to new settings that result in learning of significant new knowledge. Misko goes on to provide an outline of the factors that research has shown to facilitate or inhibit transfer, as well as a discussion of the implications of this for teaching/training.

The issue of transfer has also been raised in relation to the key competencies, which are viewed as basic enabling competencies for work, education and life generally.

The key competencies identified by the Mayer Committee were:

- collecting, analysing and organising information
- communicating ideas and information
- planning and organising activities
- working with others and in teams
- using mathematical ideas and techniques
- solving problems
- using technology

In addition, some Australian key competency pilot projects have trialled 'cultural understanding' as an additional key competency. A recent report (Hager et al. 1997) synthesises the findings of key competencies projects conducted in the Australian vocational education and training (VET) sector. This report concluded that as well as confirming the role of key competencies as basic, enabling competencies for work, education and life generally, the projects demonstrated that they have the following advantages:

- They enable learners to develop other capacities increasingly valued in the workplace, such as creating an enterprising culture, assuring quality, learning to learn and lifelong learning.
- They are a powerful means to motivate unemployed youth to engage in education and training.

The role of the key competencies also helps us think about transfer in a way that is consistent with the research evidence:

> *Rather than being viewed as discrete skills that people learn to transfer, the key competencies should be seen as learnt capacities to handle an increasing variety of diverse situations. Thus transfer becomes more a growth in confidence and adaptability as learners experience ever more success in their deployment of the key competencies to a range of situations. To put it another way, perhaps it is not so much the key competencies that transfer, as growing understanding of how to deal with different contexts.* (Hager et al. 1996, p. 82)

Contextuality of workplace competence and its implications

The contextuality of workplace competence has received some recognition in the implementation of national training reform, principally in the acceptance that in some instances it may be necessary to produce enterprise spec fic versions of industry competency standards (e.g. McDonalds Family Restaurants, Chubb Security). This contextuality of workplace competence may raise questions about the value of generic training programs in some cases. For instance, Bodi et al. (1996) found that in the meat industry site that was the focus of their research project, a train-the-trainer program that was bought in from outside of the enterprise and the industry failed to produce competent trainers. They recommend that such courses 'need to be enterprise-specific in terms of content, delivery and evaluation.' (Bodi et al. 1996, p. 32). On the basis of their automotive industry research project, Sefton et al. (1995) summarise this issue best when they point out:

> *. . . the need for a great deal of the training (on topics such as company policies, enterprise technology and equipment, company work systems, new enterprise products, customers and suppliers of the company and the introduction of new technologies into the workplace) to be highly contextualised and enterprise specific. However, there are some areas that could benefit from generic curriculum resource packages, such as occupational health and safety, rights and responsibilities of employees, industry or business context, etc. However, much of this material would also need to be contextualised to the specific workplace. It would appear to be counter-productive to send people to class to learn generic curriculum if the aim is for the workplace to become an effective learning environment.* (p. 179)

13

Very importantly, contextuality is also a characteristic feature of the key competencies. This is a unanimous finding of a number of research projects (e.g. Stevenson (ed.) 1996, Gonczi et al. 1995, Hager et al. 1996). Recent research on the role of key competencies in work has shown that when any significant component of work is considered, there tends to be a clustering of key competencies together with more specific competencies as well as features that are particular to the context. Thus the key competencies, by their nature, serve to direct attention onto broader approaches to competence. A second crucial feature of key competencies is their strong sensitivity to changes in work context. The different forms that key competencies take in different workplace contexts has now been confirmed by both Australian (Gonczi et al.

1995, Hager et al. 1996, Stevenson (ed.) 1996) and overseas (Stasz et al. 1996) research. Stasz et al. concluded that:

> *. . . whereas generic skills and dispositions are identifiable in all jobs, their specific characteristics and importance vary among jobs. The characteristics of problem solving, teamwork, communication, and disposition are related to job demands, which in turn depend on the purpose of the work, the tasks that constitute the job, the organisation of the work, and other aspects of the work context.* (p. 102)

The Australian research also found, amongst other things, that different combinations of key competencies are required in different industries and occupations. Also, that the customer service industries, in contrast to other industries studied, seemed to require a wider range of the key competencies (Gonczi et al. 1995). This was so because the provision of quality customer service typically involves nearly all of the key competencies. For instance, a salesperson, who finds out and clarifies a customer's needs, explains the range of available options, helps the customer to reach a decision, and then advises them on what needs to be done to implement the decision, has made major use of at least the first three key competencies (collecting, analysing and organising information; communicating ideas and information; and planning and organising). And this is only a part of their job. It has been found also that the key competencies are major features of work in workplaces that focus on high performance or high quality products (Field & Mawer 1996, Gonczi et al. 1995).

14

Hence it would seem that the key competencies are a very suitable vehicle for studying variations in the four previously noted interrelated factors that Ford identified as crucial for the creation of a responsive workplace culture: new kinds of work organisation, innovations in technology, innovative skill formation practices, and innovations in employee commitment, participation and remuneration. This is doubly so because the nature of the Australian key competencies is such that they jointly underpin much that is involved in each of these areas.

It appears, then, that the key competencies provide an antidote to the widespread tendency to view competency standards in a narrow, task-based way. As Hager et al. (1996) conclude:

the key competencies provide a good basis for viewing work more holistically. As a general principle, if it is found that particular units of work can be described without involving the key competencies, then the work units are probably being described too narrowly to be very useful from a training perspective. (p. 82)

Portability of skills

The desirability of portable skills is a central given of national training reform. Thus the perceived importance of people having a generally recognised written record of their skill attainments. However, there are still some tensions surrounding this issue. In particular, some employers worry that the main effect of portable skills will be increasing staff attrition. As the above discussions of transfer and the contextuality of workplace competence imply, portability should not be taken to mean that new employees will not need an induction period when they move on to a different job. There is not a lot of research that directly focusses on portability. However there is some evidence that when asked about the portability of their skills, workers tend to think only in terms of specific skills, thereby overlooking their more generic capacities (Wilson & Engelhard 1994, pp. 14–15). Thus it seems that workers are likely to underestimate the quantum of their skills that is portable.

Outcomes of training

At first sight, the outcomes of training might be thought to be relatively simple. If the training is successful, then, obviously, the required skills have been learnt. However, matters are more complex than this. For example, if a firm trains its staff in certain skills but they never use the skills, the outcomes of this training are probably unsatisfactory. Catts et al. (1996) developed a linked analysis of training outcomes based on four levels of evidence:

Level 1: Evidence of staff responses to the training

Level 2: Evidence of the competencies achieved

Level 3: Evidence that the skills are used and maintained

Level 4: Evidence of effects on business performance

While it is common for the outcomes of training to be assessed at Level 1 (e.g. participants complete simple questionnaires at the completion of the training session to indicate their satisfaction or otherwise), Level 2 assessment is less common, and assessment at Levels 3 and 4 is rare.

Although there is often little attempt to assess the outcomes of training, it is common for staff of an organisation to perceive that training has produced tangible benefits. For instance, Barnett (1995 p. 6) in case studies of six assorted training providers found that 'the perception of management was that training (especially competency-based training) had produced a range of observable improvements and, as such, meant that any costs involved represented a positive investment'. Likewise, synthesising the findings of thirteen case studies of Australian companies (collected in Moy 1996), Misko (1996, pp. 85-86) noted that they found a perceived improvement in quality and quantity of work-based training in the last five years. As well, twenty discrete benefits of work-based training were identified in the case studies as a whole. The most frequently cited of these were (Misko 1996, p. 89):

- an improved occupational health and safety record and/or employee awareness (11 case studies)
- increased worker flexibility (9 case studies)
- improved productivity (9 case studies)
- customer satisfaction (demonstrated through reduced complaints, reduced 'call backs' or warranty jobs and increased repeat business (8 case studies)
- contribution to organisational goals and culture (including having a better informed workforce and enhanced credibility for the organisation within the industry) (7 case studies)
- increased relevance of the training to business requirements and job performance (5 case studies)
- increased efficiency (demonstrated through faster start-up times and less down time) (5 case studies)
- improved employee competence and more consistent job performance within the organisation (4 case studies)
- positive feedback from staff and increased employee demand for training (4 case studies)
- increased employee satisfaction (4 case studies)

While some of these can be assigned readily to the four levels of evidence in the Catts et al. analysis of training outcomes, others, such as 'increased worker flexibility' and 'having a better informed workforce' are more nebulous, thereby illustrating the elasticity of the notion of 'outcomes of training'.

Can the cost-benefits of training be demonstrated?

A more sophisticated approach to the outcomes of training is to attempt to quantify the costs and benefits. As Noble et al. (1996 p. 238) found in several large research projects on training in Australian companies/enterprises, there are few serious attempts to ascertain the costs and benefits of training outcomes. However, the rise of the national training reform agenda has stimulated a renewed interest in this question, which is one that touches on some complex issues (McDonald 1995, Misko 1996). A study by Billett (1994c), involving seven case studies within large Queensland firms, found that it is medium-term strategic goals rather than profits that firms use to justify their expenditure on training. Although unable to produce quantitative cost-benefit data for the case studies, Billett concluded that cost-benefits of training could be assessed in four areas: production, staff, equipment, and work practice.

Building on Billett's research, Catts et al. (1996) investigated the return on investment for training undertaken in four small retail businesses in provincial cities in south-east Queensland. Based on the four-level, linked analysis discussed in the previous section, the results of this study were mixed. In one firm the training was found to have a positive longer-term effect, in another the training had short-term effects that were not sustained. In a third firm the training, coupled with other factors, had an adverse effect. In the fourth firm the training was not completed within the time frame of the research. Given the restricted nature of this study, further research of this general kind is warranted. (Further discussion of the intricacies of this kind of research can be found in the companion 'stocktake report' *Returns to Enterprises from Investment in VET* [Billett & Cooper 1997]).

Integration of training

'Integration of training' is a term used in the literature in several senses. Probably the most common usage refers to integration of on- and off-the-job training. For instance, this was a common concern in the case studies reported by Barnett (1995 p. 45). In this usage, the concern is with integrating off-the-job training with formal on-the-job training. In these cases informal learning in the workplace is not included as a significant component. A related, but different, sense of 'integration of training' refers to the emerging problem that

formal off-the-job VET courses are unable to produce graduates that fully meet workplace competency standards. As a general rule, workplace competency standards include elements that require significant learning experiences in fully operational workplace conditions. In recognition of the fact that off-the-job training cannot supply these learning experiences, it is sometimes said that off-the-job training can produce 'workplace ready' graduates but not 'workplace competent' ones (Hager 1994, p. 10). In response to this, there have been various initiatives that seek to integrate off-the-job training with appropriate kinds of workplace experience. For example a metals industry project proposed three different models for implementing integrated training of this kind (Australian Committee on TAFE Curriculum 1991). It is interesting that this appears to be a case where as well as formal off-the-job training and on-the-job training being relevant, informal learning in the workplace may also be a significant component. To the extent that this is so, the challenge will be to provide significant amounts of the right kinds of real workplace experience. This is an area for further research.

Another sense of 'integration of training' covers cases where training is specifically linked to particular programs, such as quality improvement (Misko 1996, p. 98) or enterprise-specific workplace standards (Misko 1996, p. 100). A still broader sense of 'integration of training' seeks to take account of the wide range of factors that can significantly influence training within an organisation. For example, Sefton et al. (1994) reports on a project that piloted the delivery of the Vehicle Industry Certificate within six enterprises across the industry. They worked with a 'model of integrated training' that sought to combine in a 'practical, ethical, innovative and thoughtful' way the following components:

- a conceptual framework (or set of ideas) on learning, language, workplace change and so on
- a set of strategies for action and implementation
- a set of principles on learning in the workplace

They defined 'integrated training' as 'training which is based on those elements which are integral to the training context'. These elements include such factors as:

- organisational and technical systems
- key competencies

- the technical language and 'lingua franca' of the workplace
- cultural factors
- The social, political and industrial parameters and constraints affecting the workplace including change initiatives
- access and equity issues
- existing skills and potential of employees

(Sefton et al. 1994, p. 8)

This integrated approach to training also informed a subsequent major project (Sefton et al. 1995). These projects are notable for taking account of formal off-the-job training, on-the-job training, and informal learning in the workplace. More important, they argue that even more crucial are the appropriate links between formal training and informal learning in the workplace (Sefton et al. 1995, p. 2). According to the reports, both of these projects were successful. Their significance seems to be such that further follow up work would be worthwhile, e.g. in different industries and in different kinds of workplace contexts.

Factors that affect the quality of learning in the workplace

THE QUALITY OF the learning that occurs in the workplace is very sensitive to a range of factors. Major ones that will be discussed in this section include:

- the workplace environment/culture
- authentic learning experiences
- quality of learning materials
- role of language and literacy
- company/business size

Clearly various of these factors overlap and interrelate to some extent, particularly as they impact on learning in the workplace whether it be formal or informal.

The workplace environment/culture

In the first section of this report, the major impact of Australia's national training reform agenda on workplaces and the learning that takes place within them was noted. Drawing on Ford (1990), these changes were located within the larger international picture. Given the seeming inevitability of change in the workplace, participants would appear to have no alternative but to engage in learning of some kind. This learning will be significantly shaped by the broad features of the workplace environment/culture. Since there is wide scope for ongoing change in the workplace environment/culture, such learning will potentially be of several kinds over several phases. This situation of workplace instability can be represented by a model developed by Hayton and Loveder (1992). This model draws on the work of Bolwijn and Kumpe (1990), who based their version of the model on data from case studies carried out in the manufacturing sectors of several industrialised countries.

Hayton and Loveder adapted the model for the purposes of describing broad features of the workplace environment/culture of the four Australian organisations that they were studying. In this model organisations are seen as progressing along four organisational phases, each with their own distinctive performance criteria and structure/culture requirements. These differences are shown in figure 1.

Figure 1: The four phases of development for an organisation (adapted from Bolwijn and Kumpe (1990)

Organisational phase	Performance criteria	Structural/culture requirement
Efficient firm	efficiency	specialisation and hierarchical organisation
Quality firm	efficiency + quality	communication and co-operation
flexible firm	efficiency + quality + flexibility	integration and decentralisation
innovative firm	efficiency + quality + flexibility + [illegible]	[illegible] and decentralisation

(Hayton & Loveder 1992, p. 2)

A model like this has the merit of highlighting the diversity of variables in the workplace environment/culture that will shape the learning which takes place there. It distinguishes structural variables from cultural ones and links them both to various market orientations. It also suggests that these variables may change in a relatively orderly way as the organisation moves from being efficient through to being innovative (see figure 2). While recognising that 'companies or parts of companies will never show the "pure" characteristics of one phase' (p. 2), Hayton and Loveder (1992) nevertheless found that all four organisations they studied were in the first two phases. Given that the organisations were selected for study on the basis that they were well advanced in workplace reform and award restructuring processes, this suggests that theories are well in advance of actual Australian practice in this area.

BEST COPY AVAILABLE

Figure 2: Structural and cultural change pathway

(Hayton & Loveder 1992, p. 3)

McKavanagh (in Stevenson (ed.) 1996, pp. 188–203) has developed, trialled and validated a Workplace Learning Environment Questionnaire which 'can be used to assess psychosocial aspects of informal, on-the-job learning environments'. The questionnaire is based on five dimensions: support, clarity, independence, collaboration and innovation. According to McKavanagh (p. 188) 'learning in workplaces is more clearly defined, more collaborative, and more innovative; but is less supported and offers less independence'. Although this claim may be broadly true, it no doubt depends on individual circumstances.

It is clear from the above that good research on learning in the workplace will need to take proper account of the diversity of variables in the workplace environment/culture that will help to shape such learning. The research projects by Sefton et al. (1994, 1995) are good examples in this respect. Sefton et al. (1995, p. 61) offers 'a framework for investigating workplace learning and change' which provides a good starting point for policy makers and researchers thinking about these matters.

Authentic learning experiences

Providing trainees with opportunities to learn from real tasks that matter in a workplace setting achieves better learning. Such learning is known as 'authentic learning'. In particular, as Billett (1993, 1994a, 1994b, 1996) has shown, it strengthens procedural knowledge, i.e. knowledge of the techniques and skills that comprise 'how to get things done' in this particular workplace.

Gaining procedural knowledge is viewed as an important part of the development of workplace know-how. Authentic learning experiences also encourage learners to become active participants in their own learning. Although informal workplace learning is authentic learning by definition, on-the-job training may be authentic or not depending on circumstances. Hager (1994) argues that the term 'on-the-job' should be reserved for cases that are authentic.

Quality of learning materials

Chandler et al. (1995) applied recent research in cognitive theory to the design of computer-based training packages for use in the workplace. Traditional on-the-job training packages were found to be largely ineffective when compared with multimedia instruction based on cognitive models. This kind of research is obviously significant for those involved in the production of on-the-job training packages of all kinds.

Role of language and literacy

Recent research in the area of language and literacy stresses the highly contextual nature of speech and writing. How we speak and write is very much shaped by the particular situations we are in and by our own purposes. Thus language and literacy are important components of the learning that occurs in workplaces. Sefton et al. (1994) provides a good example of a training project that seeks to incorporate language and literacy into the overall project design. Language and literacy considerations are also important in the assessment of learning that has occurred in the workplace (see Bloch & Thomson 1994, pp. 21–22).

Company/business size

Not surprisingly, formal structures for on-the-job training are contingent on company/business size. Misko (1996) found that the great majority of small companies had no formal structures for work-based training, while about half of medium-sized and three-quarters of large enterprises had such structures in place. Similar findings were obtained by Gonczi et al. (1995, pp. 22–23). However, Misko also found that, irrespective of size, many of the companies that lacked formal structures for on-the-job training provided informal training as needed, e.g. when inducting new employees.

Recognition of learning in the workplace

Crediting workplace performance

AUSTRALIA'S NATIONAL TRAINING reform program, with its complementary roles for on- and off-the-job training and more flexible pathways and delivery, has promoted the public recognition of competence no matter how it was acquired. As noted earlier, off-the-job education/training and formal on-the-job training are alike, with similar procedures for assessing and accrediting achievement in them. The same cannot be said for informal workplace learning. These differences can be brought out by considering what 'recognition of prior learning' involves in each of the three cases.

- For off-the-job education/training (usually formal classroom learning), 'recognition of prior learning' is well known and established. It is usually called 'credit transfer' and involves matching content and levels of subjects completed by the candidate in other courses.
- For formal on-the-job training, 'recognition of prior learning' involves the candidates showing that they have achieved specific learning outcomes (or perhaps demonstrating that they meet competency standards).
- For informal workplace learning, 'recognition of prior learning' is at once more easy and more difficult. It is more easy in the case where overall recognition in the particular occupation is concerned. For example, suppose someone has become a very successful tailor without any formal training. Recognition of their standing as a tailor is relatively straightforward—they have samples of their work, testimony of customers and other tailors, etc. On this basis, they would likely be admitted to (say) an advanced course in tailoring, even though they lacked formal qualifications. But suppose they apply for admission to a diploma in costume design and fabrication, with exemptions based on their work knowledge and experience? Here matters will likely become somewhat tricky. There may be some skill components for which recognition is fairly easy. It will be the underpinning knowledge and understanding acquired in the practice of tailoring, much of it tacit,

which will not readily match up against the content of the diploma course. One problem here is that the know-how gained by informal workplace learning is not strictly equivalent to any course content. As noted earlier, formal courses cannot turn out fully competent graduates precisely because this know how can only be gained, apparently, from actual workplace experience. Another problem is that the nature of this know how is not well understood anyway (see Hager 1996).

Reflecting these differences between recognition of the three kinds of learning Wilson and Lilly (1996) found 'considerable confusion exists regarding the meaning and use of the term RPL'. This confusion is exacerbated by differences in interpretation and terminology between States and Territories. Thus, despite the wide acceptance of RPL that has developed in Australia, there is significant scope for further research and development to refine and extend this initiative.

Assessing on-the-job

The most detailed Australian research project on on-the-job assessment was carried out by Bloch and Thomson (1994). They selected a diverse range of eight case studies to provide examples of best practice in competency-based assessment both on- and off-the-job across a range of training programs, industry and occupational settings. Particular issues identified as crucial in this research were the proper training of assessors; the value of integrated, more holistic assessments; the need to ensure adequate validity and reliability of assessment; the need for training and assessment to take into account the literacy, numeracy and language needs of trainees; the extent to which standards can be made enterprise specific whilst still allowing candidates to maintain skills portability; and the need for improved assessment instruments. Further research on these issues would be timely.

Record keeping

Enterprises need to record the results of workplace assessments. However, it is not possible to generalise on this matter since there will be differences in how records are maintained depending on the kind of context in which the assessment occurs and its purpose (Hager et al. 1994, p. 77). For example, Jeffrey (1992 pp. 45–46) reports on recording arrangements in cases where the

training involves joint co-operation of enterprises and VET colleges. In general, considerations of portability require that assessment candidates have a duly certified statement of their assessment results as evidence of their skills that can be presented to prospective employers. So far, however, there does not appear to be much Australian research on this topic. General details about managing assessment systems are given in Hager et al.

Industrial relations issues

As a result of the implementation of national training reform in Australia, a de facto relationship exists between remuneration and skill levels. Thus there is a 'danger that industrial relations issues related to awards would distort education and training planning and policy' (Bloch and Thomson 1994, p. 9). So it is very important that the procedures for recognition of learning and competence discussed in this section be fair and equitable. Maggs and Bodi (1996 p. 26) argue that, on the evidence of their meat industry project, 'industrial issues . . . cannot be ignored if a training program is to be successful'. In their case, the enterprise-based training program which they judge to be very successful, was linked in to an enterprise-bargaining process and an internal grading system. The 'framework for investigating workplace learning and change' (Sefton et al. 1995, p. 61), mentioned earlier supports this argument as it incorporates major industrial relations issues.

Findings and directions for further research

Findings

RESEARCH ON LEARNING in the workplace is a fairly recent phenomenon. This research has focussed more on on-the-job training than on informal workplace learning. Since learning in the workplace is assuming more prominence in the national training reform process, interest in this topic is likely to grow. So far, research has demonstrated that:

- Simple notions of transfer of skills learnt in the workplace are very dubious.
- While some learning in the workplace is highly contextualised and enterprise specific, other examples of it are more generic.
- Measuring the outcomes of training and quantifying the cost-benefits are possible but complex.
- The best kinds of learning in the workplace involve appropriate links between formal training and informal workplace learning.
- Good research on learning in the workplace needs to take proper account of the diversity of variables in the workplace environment/ culture.
- Language, numeracy and literacy are capable of being fruitfully addressed in an holistic way along with other changes as workplace reform is implemented.
- There is a lot of confusion about recognition of prior learning even though it enjoys widespread support as a principle.

Directions for further research

In general, learning in the workplace, especially the informal kind, needs a lot more high quality research, especially given the importance it is attaining due

to workplace reform. More specific topics that would benefit from closer research include:

- the more lasting outcomes of training and their cost-benefits
- the nature of productive links between formal training and informal workplace learning
- application of recent research in cognitive theory to the design of training activities in the workplace
- the role of language, numeracy and literacy in learning in the workplace and workplace change
- applications of recognition of prior learning to informal workplace learning
- assessment of learning in the workplace
- record keeping and management of assessment systems

References

Allen Consulting Group 1994a, *Successful Reform: Competitive Skills for Australians and Australian Enterprises*, Report to The Australian National Training Authority, June, Allen Consulting Group, Melbourne.

Allen Consulting Group 1994b, *Assessment of Structures Supporting National Training Reforms*, Working Paper for The Australian National Training Authority, May, Allen Consulting Group, Melbourne.

Allen Consulting Group 1994c, *Australia's National Training Reforms: Views of Interested Parties*, Working Paper for The Australian National Training Authority, May, Allen Consulting Group, Melbourne.

Allen Consulting Group 1994d, *Case Studies: Experiences with Training and the National Training Reforms*, Working Paper for The Australian National Training Authority, May, Allen Consulting Group, Melbourne.

ANTA 1994, (Australian National Training Authority)*Proposals for More Effective Implementation of Training Reforms*, Report to ANTA Ministerial Council, ANTA, Brisbane.

Australian Chamber of Commerce and Industry 1995, *CBT: Case Studies in Competency Based Training*, Australian Chamber of Commerce and Industry, Melbourne.

Australian Committee on TAFE Curriculum 1991, *The Integration of Structured Training Competence and Workplace Practice Competence: A Model Developed for the National Metals and Engineering Modules*, Report to the Australian Committee on TAFE Curriculum (ACTC) Ministerial Council, Perth.

Barnett, K 1995, *Australian Industry and Enterprise Training Providers*, National Centre for Vocational Education Research, Adelaide.

Barnett, K & Wilson, S 1994, *Challenges and Choices: A Study of Four Providers of Adult Community Education*, National Centre for Vocational Education Research, Adelaide.

Billett, S 1993, 'Authenticity and a Culture of Practice Within Modes of Skill Development', *Australian and New Zealand Journal of Vocational Education Research*, vol. 1, no. 2, pp. 1–28.

Billett, S 1994a, 'Situated Learning - A Workplace Experience', *Australian Journal of Adult and Community Education*, vol. 34, no. 2, pp. 112–130.

Billett, S 1994b, 'Authenticity in Workplace Settings' in J Stevenson (ed.) *The Development of Vocational Expertise*, National Centre for Vocational Education Research, Adelaide.

Billett, S 1994c, *Cost Benefits of Training: A Queensland Study*, Queensland Training Officers' Society, Brisbane.

Billett, S 1996, 'Understanding Workplace Learning: Cognitive and Sociocultural Perspectives', paper presented to the national colloquium *Research on Workplace Learning: Defining the Agenda*, Research Centre for Vocational Education and Training, University of Technology, Sydney.

Billett, S & Cooper, M 1997, *Returns to Enterprises from Investment in VET*, National Centre for Vocational Education Research, Adelaide.

Bloch, B & Thomson, P 1994, *Working Towards Best Practice in Assessment*, National Centre for Vocational Education Research, Adelaide.

Bodi, A, Greig, A, Maggs, G & Testi, J 1996, *Evaluation of Training in the Australian Meat Processing Industry*, Meat Research Corporation, Melbourne.

Bolwijn, P & Kumpe, T 1990, 'Manufacturing in the 1990s: Productivity, Flexibility and Innovation', *Long Range Planning*, vol. 23, no. 4, pp. 44–57.

Bryce, M (ed.) 1995, *Delivering Training Reform: The Critical Role of Employers and the Workplace*, Australian Centre for Industrial Relations Research, University of Sydney.

Catts, R with McLendon, E, Forlin, C, Arden, C, James, J & Kossen, C 1996, *Validating Training Benefits in the Workplace*, VETRI, University of Southern Queensland, Toowoomba.

Chandler, P, Sweller, J & Jones, B 1995, *Using Cognitive Science to Develop New Training Techniques for the Workplace*, Final Report of ANTA National Research Advisory Council Large Research Project (typed ms.).

Department of Employment, Education and Training 1995, *Flexible Training at Work*, A Video and Handbook, Open Learning Technology Corporation Ltd., Bedford Park, SA.

Field, L & Ford, G W 1995, *Managing Organisational Learning: From Rhetoric to Reality*, Longman Australia, Melbourne.

Field, L & Mawer, G 1996, *Generic Skill Requirements of High Performance Workplaces*, DETEC, Sydney. A report commissioned by the NSW Key Competencies Pilot Project, Dept. of Training and Education Co-ordination.

Ford, G W 1990, *Rethinking Skilling for a Restructured Workplace*, The Commission for the Future Occasional Paper No. 10, AGPS, Canberra.

Gonczi, A, Curtain, R, Hager, P, Hallard, A & Harrison, J 1995, *Key Competencies in On-the-Job Training.*, UTS, Sydney. A report commissioned by the NSW Key Competencies Pilot Project, Dept. of Industrial Relations, Employment, Training and Further Education.

Hager, P 1994, *On-the-job and Off-the-job Assessment - An Issues Paper*, Assessment Centre for Vocational Education, TAFE NSW, Sydney.

Hager, P 1996, 'Professional Practice in Education: Research and Issues', *Australian Journal of Education*, vol. 40, no. 3, pp. 235–47.

Hager, P, Athanasou, J & Gonczi, A 1994, *Assessment Technical Manual*, Department of Employment, Education and Training, AGPS, Canberra.

Hager, P & Butler, J 1996, 'Two Models of Educational Assessment', *Assessment & Evaluation in Higher Education*, vol. 21, no. 4, pp. 367–78.

Hager, P, McIntyre, J, Moy, J, Comyn, P, Stone, J, Schwenke, C & Gonczi, A 1996, *Workplace Keys: Piloting the Key Competencies in Workplace Training.*, UTS, Sydney. A report commissioned by the NSW Key Competencies Pilot Project, Department of Training and Education Co-ordination.

Hager, P, Moy, J & Gonczi, A, 1997, *Piloting the Key Competencies in the Australian Vocational Education and Training Sector and Workplaces - A Synthesis Report*. Department of Training and Education Co-ordination, Sydney.

Hayton, G & Loveder, P 1992, *Workplace Reform and TAFE: Four Case Studies*, National Centre for Vocational Education Research, Adelaide.

Jeffrey, D 1992, *Workplace Training in the Metal & Engineering Industry*, Engineering Skills Training Development Centre, Victoria.

Maggs, G & Bodi, A 1996, *The Evaluation of Meat Industry Training: An Enterprise Perspective*, Meat Research Corporation, Melbourne.

McDonald, R 1995, *Costing Training and Assessment - Issues Paper*, Assessment Centre for Vocational Education, TAFE NSW, Sydney.

McIntyre, J, Petocz, P, Hayton, G, Noble, C, Smith, A & Roberts, P 1996, *Final Report: Enterprise Training in Australia*, Office of Training and Further Education, Melbourne.

Misko, J 1995, *Transfer: Using Learning in New Contexts*, National Centre for Vocational Education Research, Adelaide.

Misko, J 1996, *Work-based Training Vol. 1: Costs, Benefits, Incentives and Best Practice*, National Centre for Vocational Education Research, Adelaide.

Moy, J (ed.) 1996, *Work-based Training Vol. 2: Case Studies*, National Centre for Vocational Education Research, Adelaide.

Noble, C, Smith, A & Gonczi, A 1996, *Enterprise Training in Australia: Industry Profiles and Case Studies*, Office of Training and Further Education, Melbourne.

NSW Government Green Paper 1996, *The Construction Industry in New South Wales: Opportunities and Challenges*, NSW Department of Public Works and Services, Sydney.

Sefton, R, Waterhouse, P & Deakin, R (eds.) 1994, *Breathing Life into Training: A Model of Integrated Training*, National Automotive Industry Training Board, Doncaster, VIC.

Sefton, R, Waterhouse, P & Cooney, R 1995, *Workplace Learning & Change: The Workplace as a Learning Environment*, National Training Board for the Automotive Industry, Doncaster, VIC.

Smith, E, Hill, D, Smith, A, Perry, P, Roberts, P & Bush, T 1995, *The Availability of Competency-Based Training in TAFE and Non-TAFE Settings in 1994*, Group for Research in Employment & Training, Charles Sturt University, Wagga Wagga.

Stasz, C, Ramsey, K, Eden, R, Melamid, E & Kaganoff, T 1996, *Workplace Skills in Practice*, Rand/National Center for Research in Vocational Education, Santa Monica, CA.

Stevenson, J (ed.) 1996, *Learning in the Workplace: Tourism and Hospitality*, Centre for Skill Formation Research and Development, Griffith University, QLD.

TAFE National Staff Development Committee 1992, *Work Based Learning*, A Report Identifying the Implications for TAFE Teacher Training and Retraining, State Training Board Victoria.

Wilson, B & Engelhard, M 1994, *Young People in Full-Time Work: Issues Affecting Apprentices*, Youth Research Centre, University of Melbourne.

Wilson, J & Lilly, M 1996, *Recognition of Prior Learning*, National Centre for Vocational Education Research, Adelaide.

This review of research on vocational education and training is one of a series of reports commissioned to guide the development of future national research and evaluation priorities.

Paul Hager has reviewed changes and issues in workplace learning in Australia over the past six years. He draws conclusions relevant to vocational education and training policy and identifies areas for further investigation.